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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/057,728

01/25/2002

Clifford Liem

IMP-004 (8326/7)

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23701 7590 02/27/2007
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EXAMINER

TO, JENNIFER N

ART UNIT

PAPER NUMBER

2195

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

02/27/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/057,728

Applicant(s)

LIEM ET AL.

Examiner

Jennifer N. To

Art Unit

2195

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 November 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11, 13, 14 and 23-36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-11, 13, 14 and 23-36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-11, 13-14, and 23-36 are pending for examination.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-5, 7-8, 10-11, 13-14, and 34-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Aoki et al. (hereafter Aoki) (U.S. Publication No. 2001/0003187).

4. As per claim 1, Aoki teaches the invention as claimed including a method of compiling a high level language to map a plurality of tasks and a plurality of data onto a configurable multiprocessor, distributed memory hardware architecture (fig. 5; abstract; paragraphs [0001], [0029]-[0030]), the method comprising:

describing a task-level network of behaviors that defines an embedded system in the configurable multiple processor, distributed memory hardware architecture (figs. 6-9; paragraphs [0004]-[0006], [0053], [0091], execution condition of the task is a task-level network of behavior), each of the task-level network of behaviors being related to each other through control and data flow (each execution condition themselves related to

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each other based upon tasks being related through conditions wherein each task related to each other based upon the condition);

predicting a schedule of tasks for the task-level network of behaviors (claims 1, 4, 5);

allocating the plurality of tasks to at least one processor and allocating plurality of data to at least one distributed memory in the configurable multiple processor, distributed memory hardware architecture in response to the predicted schedule of tasks (paragraphs [0054], [0056]); and

generating machine executable code with the allocated plurality of tasks and allocated plurality of data for the configurable multiple processor, distributed memory hardware architecture (paragraphs [0065], [0074]).

5. As per claim 2, Aoki teaches that wherein the predicting the schedule of tasks comprises minimizing execution time of the plurality of tasks (paragraph [0079]).

6. As per claim 3, Aoki teaches that wherein the predicting the schedule of tasks comprises minimizing the schedule of tasks by allocating data to at least one distributed memory in the configurable multiple processor, distributed memory hardware architecture in order to minimize data transfers (paragraphs [0070]-[0072]).

7. As per claim 4, Aoki teaches that wherein the predicting the schedule of tasks comprises maximizing parallel execution of the plurality of tasks on at least two

processors in the configurable multiple processor, distributed memory hardware architecture (paragraphs [0076]-[0077]).

8. As per claim 5, Aoki teaches that wherein the allocating the plurality of tasks to at least on one processor in the configurable multiple processor, distributed memory hardware architecture, which has optimal processor resources for the tasks (paragraph [0059]).

9. As per claim 7, Aoki teaches that that wherein the predicting the schedule of tasks comprises using an interval graph and an execution time model of the task-level network of behaviors to predict the schedule of tasks (paragraphs [0082]-[0092]).

10. As per claim 8, Aoki teaches that wherein the allocating the plurality of tasks and data comprises an iterative allocation process (fig. 13).

11. As per claim 10, Aoki teaches using a high-level language to describe task-level network behaviors(paragraphs [0001], [0029]-[0030]).

12. As per claim 11, Aoki teaches parsing the high-level programming language into an intermediate form (fig. 5).

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13. As per claim 13-14, Aoki teaches allocating data to private memories/shared memories (paragraph [0076]).

14. As per claims 34-36, they are rejected for the same reason as claims 1, and 11 above.

Claim Rejections - 35 USC § 103

15. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

16. Claims 6, 9, and 23-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aoki et al. (hereafter Aoki) (U.S. Publication No. 2001/0003187), as applied in claim 1, and in view of Dave et al. (hereafter Dave) (U.S. Patent No. 6110220).

17. Dave was cited by applicant IDS filed 10/28/2002.

18. As per claim 6, Aoki teaches the invention substantially as claimed in claim 1. Aoki did not specifically teach that wherein the predicting the schedule of tasks comprises using resource-based module of the configurable multiple processor, distributed memory hardware architecture to predict the schedule of tasks.

19. However, Dave teaches that wherein the predicting the schedule of tasks comprises using resource-based module of the configurable multiple processor, distributed memory hardware architecture to predict the schedule of tasks (col. 3, lines 40-64).

20. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Aoki and Dave because Dave teaching of using a resource-based model to predict the schedule of tasks would improve the integrity of Aoki's system by providing an algorithm/model that estimated the resources requirement to generate the schedule of tasks.

21. As per claim 9, Aoki teaches the invention as claimed in claim 1, and 8. Aoki did not specifically teach that wherein the iterative allocation process comprises using a demand-driven and constraint-based objective function.

22. However, that wherein the iterative allocation process comprises using a demand-driven and constraint-based objective function (fig. 4).

23. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Aoki and Dave because Dave teaching of using a demand-driven and constraint-based objective function to allocating the plurality of tasks and data to the configurable multiple processor, distributed memory

hardware architecture would improve the integrity of Aoki's system by providing an efficiency way of mapping a plurality of tasks and data onto the processors.

24. As per claim 23, Aoki teaches the invention substantially as claim including a method of compiling a high level language to execute a schedule of tasks in a configurable multiple processor, distributed memory architecture (fig. 5; abstract; paragraphs [0001], [0029]-[0030]), the method comprising:

generating the schedule of tasks based at least in part on a task-level network of behaviors, that defines embedded system (claims 1, 4, 5); and

generating machine executable code with the allocated plurality of tasks for the configurable multiple processor, distributed memory hardware architecture (paragraphs [0065], [0074]).

25. Aoki did not specifically teach the step of calculating a demand function based at least in part on a constraint related to at least one of a plurality of tasks in the schedule of tasks, and allocating a task having highest priority to a processor having least cost according to the demand function.

26. However, Dave teaches calculating a demand function based at least in part on a constraint related to at least one of a plurality of tasks in the schedule of tasks (col. 7, line 12 through col. 8, line 17; col. 9, lines 45-67), and allocating a task having highest

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priority to a processor having least cost according to the demand function (col. 10, lines 1-63; col. 11, line 48 through col. 12, lines 1-35).

27. It would have been obvious to one of an ordinary skill in the art at the time the invention was made to have combined the teaching of Aoki and Dave because Dave teaching of calculating a demand function based at least in part on a constraint related to at least one of a plurality of tasks in the schedule of tasks, and allocating a task having highest priority to a processor having least cost according to the demand function would improve the integrity of Aoki's system by providing an efficiency way of mapping a plurality of tasks and data onto the processors.

28. As per claim 24, Dave teaches allocating a data block to a memory in the distributed memory (col. 5, lines 63-65; col. 9, lines 34-45).

29. As per claim 25, Dave teaches that the demand function is calculated based at least in part on the task-level network of behaviors (col. 9, lines 13-67).

30. As per claim 26, Dave teaches that the demand function is calculated based at least in part on an impact on the schedule of tasks (col. 9, lines 13-67).

31. As per claim 27, Dave teaches that wherein the demand function is calculated based at least in part on an impact on data movement (col. 9, lines 13-67).

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32. As per claim 28, Dave teaches that wherein the demand function is calculated based at least in part on prior allocation decisions (col. 9, lines 13-67).

33. As per claim 29, Dave teaches that wherein the cost is defined as a least negative impact on at least one performance factor (col. 9, lines 13-67).

34. As per claim 30, Dave teaches that wherein the at least one performance factor comprises the schedule of tasks (col. 9, lines 13-67).

35. As per claim 31, Dave teaches that wherein the at least one performance factor comprises data movement (col. 9, lines 13-67).

36. As per claim 32, Dave teaches allocating a task having next highest priority to a processor having next least cost according to the demand function (col. 10, lines 35-63).

37. As per claim 33, Dave teaches recalculating the demand function in response to each task in the plurality of tasks being allocated to a processor (col. 6, lines 10-16).

Response to Arguments

38. Applicant's arguments with respect to claims 1-11, 13-14, and 23-36 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

39. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Campbell et al. (WO 87/06034) and Campbell et al. (U.S. Patent No. 5021947) teach a data-flow multiprocessor architecture for efficient signal and data processing.

Yokoya (U.S. Patent No. 6199093) teaches a processor allocating method used in a multiprocessor system capable of executing a plurality of tasks in a parallel manner.

40. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jennifer N. To whose telephone number is (571) 272-7212. The examiner can normally be reached on M-T 6AM- 3:30 PM, F 6AM- 2:30 PM.

41. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

42. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

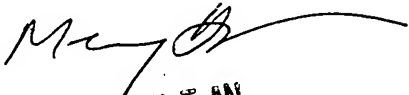
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Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jennifer N. To
Examiner
Art Unit 2195


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ART UNIT 2195